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## The Growth Mindset (Part 1)

Carol S. Dweck, Ph.D. • October 2007

Topic: Encouraging Girls in Math and Science

Practice: Ability is Expandable

### Highlights

- Stanford psychology professor Dr. Carol Dweck describes her research about children's attitudes about learning and the difference between children who have "fixed" and "growth" mindsets about intelligence.
- Students who believe their intelligence is set in stone have performance-oriented goals: they want to do things they're good at. Students who believe people can get smarter have learning goals: they want to do challenging things, and they don't worry about making mistakes.
- When students are taught the "growth mindset" model, they are more motivated and perform better. This is especially true for girls in mathematics, who face negative stereotypes about their inherent math ability.

### About the Interviewee

Carol S. Dweck, Ph.D., is a leading researcher in the field of motivation and is the Lewis and Virginia Eaton Professor of Psychology at Stanford. Her research has focused on why students succeed and how to foster their

success. More specifically, her work has delineated the role of mindsets in students' motivation and has illuminated how praise for intelligence can undermine motivation and learning.

She has held professorships at Columbia and Harvard Universities, has lectured all over the world, and has been elected to the American Academy of Arts and Sciences. Her work has been prominently featured in such publications as *The New Yorker*, *Time*, *The New York Times*, *The Wall Street Journal*, *The Washington Post*, and *The Boston Globe*, and she has appeared on *Today*, *Good Morning America*, and *20/20*. Her recent book *Mindset* (published by Random House) has been widely acclaimed.

## Full Transcript

My name is Carol Dweck. I'm a professor of psychology at Stanford University. My research shows that some students believe their intelligence is just a fixed trait. They have a certain amount and that's that. It's carved in stone; they can't get any more. When students believe that, they worry about challenges. "If I make a mistake, will it mean I'm not smart?" They want to take tasks they're sure they're good at. Their primary goal in school is to look smart, or at least don't look dumb.

Other students think, "That's silly. Your intelligence is something you can develop over your whole life through effort and education." They don't think everyone's the same, but they think everyone can get smarter. When they have this view, first and foremost they want to learn. They want to do challenging things that will make them smarter, and they don't worry about mistakes. Mistakes are just part of learning.

The students who have the fixed view of intelligence have what we call performance goals. They want to look smart in their schoolwork. They don't want to do anything where they're not sure they can do it really well and show themselves to be really competent. Students who have a growth view of intelligence, the idea that you can get smarter through learning, have learning goals. They think the main thing they want to do in school is learn new things and become smarter.

Many students believe that math ability is just fixed—you have it or you don't. And then there's a stereotype on top of that that says, "Oh, maybe boys have more of it and girls have less of it." Girls are often afflicted by this stereotype, and a lot of them end up dropping out because they buy into this fixed idea that they don't have it.

When you have the fixed idea and you experience difficulty, get confused, get a poor grade on a test, you go, "Oh! I guess it means I don't have it. I better do something else." When you have a view that math abilities are something that you can learn, then when you hit difficulty or even failure, you say, "Well, I've got to learn in a different way. I've got to put more into this. I've got to work with the teacher. I've got to do more homework." You feel that you can overcome these obstacles because it's a skill you can acquire.

In a lot of research we've shown that students who have this growth mindset about their ability—they

believe it can be increased—do better over challenging school transitions. They do better on hard tasks in school in difficult courses. So we decided, why not teach some students a growth mindset and see if this helps them, especially in math where so many students stumble when they go from grade school to junior high or middle school.

We identified students who were struggling in math. We gave half of them an eight session workshop full of fantastic study skills. We gave the other half eight sessions as well. Some study skills, but also a growth mindset. They read an article about the brain. They learned that the brain becomes stronger when you exercise it, and that every time you stretch yourself, work hard, and learn something new, the brain forms new connections. Over time you get smarter. The group that just got the study skills, continued to show a decline in their math grades. The group that got study skills plus a growth mindset showed a rebound.

Also, the teachers identified—could identify—even though they didn't know there were two groups, the teachers could pick out—picked out three times as many students who were in the growth mindset workshop to say that they showed remarkable changes in their motivation. And you could even see it when you were delivering the workshop. When we introduced the idea that you are in charge of your brain, you could make yourself smarter, you could form new connections—one of the most difficult, turned off kids in the class looked up and said, “You mean, I don't have to be dumb?” And that was one of the many students who caught fire. Whether it was a boy who was turned off to school or a girl who doubted her abilities in math, they caught fire.

Other people have—like Joshua Aronson and Katherine Good have done similar interventions and they found that not only were students in general helped by learning the growth mindset, but it closed the gap between boys and girls in math. After all, a stereotype in math is like a fixed mindset. Some people have it; some people don't. Your group doesn't. But a growth mindset says to kids, “You can get it. Maybe your group hasn't had it in the past. For a number of reasons—people didn't believe in them, they didn't have the experience—but they can get it.” And so in these studies we see that girls profit even more than boys by learning the growth mindset—because it helps them combat the stereotype.

We taught math lessons to girls and boys. For half of them we told them about math geniuses who were just born that way. You know how teachers like to spice up lessons with a little history? So we told them about some math geniuses who were just born that way, and then we taught them the math lesson. The other half of the students were told about math geniuses who fell in love with math and were able to develop their amazing mathematical skills because of the effort and passion they put into it.

So what were we teaching in the first case? We were saying you're born with it or you aren't. In the second case we're saying, “If you love math, you develop your ability.” What we saw was that when girls heard the first lesson—“Math is fixed, you're born with it or you aren't”—they really fell prey to the stereotype and did very poorly on a challenging math test afterwards. When girls heard, “You just fall in love with it and work hard and become good at it,” they didn't fall prey to the stereotype. They maintained their motivation and

performance even in the face of stereotypes about females.

There are no differences in mathematical ability in young children. It doesn't look as though boys come wired for math and girls come wired for something else. The brains are equally adept at math to begin with, in every area of math that you can think of. So girls need to know that they can form new connections as well as boys can. Also, girls need to know that boys sometimes struggle. It doesn't come easily to all of them just because they're males, so they need to know that struggling is part of learning and that their brains form new connections as well as boys' do.